

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 2

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**IN THE CLAIMS:**

1. (Currently Amended) A liquid crystal display apparatus comprising:
  - a pair of substrates, at least one of which is transparent;
  - a liquid crystal layer disposed between the pair of substrates;
  - a plurality of groups of electrodes disposed on at least one of the pair of substrates for applying an electric field to the liquid crystal layer;
  - a liquid crystal display part having a plurality of active elements connected to the electrodes;
  - drive means, supplied with display data from means for supplying data to be displayed, for driving individual pixels of the liquid crystal display part by applying a voltage corresponding to the display data to the individual pixels, the drive means including data emphasis means for comparing new display data supplied from the means for supplying data to be displayed with previous display data supplied from the means for supplying data to be displayed, and for emphasizing and converting the new display data to designated display data in response to a result of the comparison and the supplied data;
  - an illumination unit including a plurality of illumination areas for illuminating the liquid crystal display part; and
  - illumination control means for controlling an illumination start time and an illumination "on" time of each of the illumination areas of the illumination unit in response to a result of the comparison and the supplied data, which is correlated with data emphasis of a new display data with a previous display data.

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 3

2. (Original) A liquid crystal display apparatus according to claim 1,  
wherein in case that any change is detected in the display data by the  
comparison, the data emphasis means emphasizes and converts the new display  
data so as to increase the change, and modifies a response of a corresponding pixel  
of the liquid crystal display part so as to be larger than a value corresponding to an  
original value of the new display data; and

wherein the illumination control means controls the illumination start time and  
the illumination "on" time of a corresponding one of the illumination areas of the  
illumination unit so that a time integral value of an amount of light passing through  
the corresponding pixel while a display characteristic is changing is substantially  
identical to a time integral value of an amount of light passing through the  
corresponding pixel while the display characteristic is stable.

3. (Original) A liquid crystal display apparatus according to claim 1,  
wherein in case that any change is detected in the display data by the  
comparison, the data emphasis means emphasizes and converts the new display  
data so as to increase the change, and modifies a response of a corresponding pixel  
of the liquid crystal display part so as to be larger than a value corresponding to an  
original value of the new display data; and

wherein the illumination control means controls the illumination start time and  
the illumination "on" time of a corresponding one of the illumination areas of the  
illumination unit so that visual sensation values with respect to light passing through

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 4

the corresponding pixel in the course of response and after response are substantially identical to each other.

4. (Original) A liquid crystal display apparatus according to claim 1, wherein the illumination start time and the illumination "on" time of the illumination areas of the illumination unit are predefined so as to be equal to average values of values for all the display data dependent on the individual display data according to the response of the liquid crystal display part after data conversion.

5. (Original) A liquid crystal display apparatus according to claim 2, wherein the illumination start time and the illumination "on" time of the illumination areas of the illumination unit are predefined so as to be equal to average values of values for all the display data dependent on the individual display data according to the response of the liquid crystal display part after data conversion.

6. (Original) A liquid crystal display apparatus according to claim 3, wherein the illumination start time and the illumination "on" time of the illumination areas of the illumination unit are predefined so as to be equal to average values of values for all the display data dependent on the individual display data according to the response of the liquid crystal display part after data conversion.

7. (Original) A liquid crystal display apparatus according to claim 1, wherein the illumination start time and the illumination "on" time of the illumination areas of

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 5

the illumination unit are changed adaptively and determined so as to be average values weighted with a number of display data to be displayed at an area among values dependent on the individual display data according to the response of the liquid crystal display part after data emphasis and conversion.

8. (Original) A liquid crystal display apparatus according to claim 2, wherein the illumination start time and the illumination "on" time of the illumination areas of the illumination unit are changed adaptively and determined so as to be average values weighted with a number of display data to be displayed at an area among values dependent on the individual display data according to the response of the liquid crystal display part after data emphasis and conversion.

9. (Original) A liquid crystal display apparatus according to claim 3, wherein the illumination start time and the illumination "on" time of the illumination areas of the illumination unit are changed adaptively and determined so as to be average values weighted with a number of display data to be displayed at an area among values dependent on the individual display data according to the response of the liquid crystal display part after data emphasis and conversion.

10. (Original) A liquid crystal display apparatus according to claim 1, wherein the light source includes a sheet-type light emitting element.

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 6

11. (Currently Amended) A liquid crystal display apparatus comprising:  
a liquid crystal display part for displaying a picture signal;  
drive means for driving the liquid crystal display part, the drive means  
including picture signal emphasis means for comparing a new picture signal supplied  
from means for supplying a picture signal with a previous picture signal supplied  
from means for supplying a picture signal, and emphasizing and converting the new  
picture signal in response to a result of the comparison and the supplied picture  
signal;  
at least one light source; and  
an illumination unit including a light amount adjusting part for adjusting an  
amount of light from the light source for a plurality of illumination areas of the  
illumination unit; and  
illumination control means for controlling the light amount adjusting part of the  
illumination unit in response to a result of the comparison ~~and the supplied picture  
signal, which is correlated with picture signal emphasis~~ of a new picture signal with a  
previous picture signal, to control a lighting timing and a lighting period of time of the  
light source.

12. (Original) A liquid crystal display apparatus according to claim 11,  
wherein the light amount adjusting part of the illumination unit is transparent to light  
when a voltage is not applied to the light amount adjusting part.

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 7

13. (Original) A liquid crystal display apparatus according to claim 11,  
wherein the light source includes a sheet-type light emitting element.

14. (Original) A liquid crystal display apparatus according to claim 11,  
wherein in case that any change is detected in the picture signal by the  
comparison, the picture signal emphasis means emphasizes and converts the new  
picture signal so that a display of a corresponding pixel in the liquid crystal display  
part is changed with a value more than a value corresponding to an original picture  
signal by arrival of a next picture signal; and

wherein the illumination control means controls the light amount adjusting part  
of the illumination unit so that a time integral value of an amount of light passing  
through the corresponding pixel while the display of the corresponding pixel is  
changing is substantially identical to a time integral value of an amount of light  
passing through the corresponding pixel while the display of the corresponding pixel  
is stable.

15. (Original) A liquid crystal display apparatus according to claim 11,  
wherein in case that any change is detected in the picture signal by the  
comparison, the picture signal emphasis means emphasizes and converts the new  
picture signal so that the change increases, and changes a display of a  
corresponding pixel in the liquid crystal display part with a value more than a value  
corresponding to an original picture signal by an arrival of next picture signal; and

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 8

wherein the illumination control means controls the light amount adjusting part of the illumination unit so that visual sensation values with respect to the light passing through the corresponding pixel in the course of response and after response are substantially identical to each other.

16. (Original) A liquid crystal display apparatus according to claim 11, wherein the lighting timing and the lighting period of time of the light source are predefined so as to be average values of values for all the display data dependent on the individual display data according to the response of the liquid crystal display part after data conversion.

17. (Original) A liquid crystal display apparatus according to claim 14, wherein the lighting timing and the lighting period of time of the light source are predefined so as to be average values of values for all the display data dependent on the individual display data according to the response of the liquid crystal display part after data conversion.

18. (Original) A liquid crystal display apparatus according to claim 11, wherein the lighting timing and the lighting period of time of the light source are changed adaptively and determined so as to be average values weighted with the number of display data to be displayed at an area illuminated by the illumination unit among values dependent on the individual display data according to the response of the liquid display part after data emphasis and conversion.

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 9

19. (Original) A liquid crystal display apparatus according to claim 12, wherein the lighting timing and the lighting period of time of the light source are changed adaptively and determined so as to be average values weighted with the number of display data to be displayed at an area illuminated by the illumination unit among values dependent on the individual display data according to the response of the liquid display part after data emphasis and conversion.

20. (Original) A liquid crystal display apparatus according to claim 14, wherein the lighting timing and the lighting period of time of the light source are changed adaptively and determined so as to be average values weighted with the number of display data to be displayed at an area illuminated by the illumination unit among values dependent on the individual display data according to the response of the liquid display part after data emphasis and conversion.

21. (New) A liquid crystal display apparatus comprising:  
a pair of substrates, at least one of which is transparent;  
a liquid crystal layer disposed between the pair of substrates;  
a plurality of groups of electrodes disposed on at least one of the pair of substrates for applying an electric field to the liquid crystal layer;  
a liquid crystal display part having a plurality of active elements connected to the electrodes;  
drive means, supplied with display data from means for supplying data to be displayed, for driving individual pixels of the liquid crystal display part by applying a



YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 10

voltage corresponding to the display data to the individual pixels, the drive means including data emphasis means for comparing new display data supplied from the means for supplying data to be displayed with previous display data supplied from the means for supplying data to be displayed, and for emphasizing and converting the new display data to designated display data in response to a result of the comparison and the supplied data;

an illumination unit including a plurality of illumination areas for illuminating the liquid crystal display part; and

illumination control means for controlling an illumination start time and an illumination "on" time of each of the illumination areas of the illumination unit, the illumination start time and the illumination "on" time are adjusted to be equal to the average of the optimum values for all the individual gradations to be covered.

22. (New) A liquid crystal display apparatus comprising:

- a pair of substrates, at least one of which is transparent;
- a liquid crystal layer disposed between the pair of substrates;
- a plurality of groups of electrodes disposed on at least one of the pair of substrates for applying an electric field to the liquid crystal layer;
- a liquid crystal display part having a plurality of active elements connected to the electrodes;
- drive means, supplied with display data from means for supplying data to be displayed, for driving individual pixels of the liquid crystal display part by applying a voltage corresponding to the display data to the individual pixels, the drive means including data emphasis means for comparing new display data supplied from the

YAMAMOTO *et al.*, Appl. No. 10/735,725  
Amdt. filed 01/25/2005  
Reply to OA mailed 10/25/2004

503.39221CX1/P5538-1/KM  
Page 11

means for supplying data to be displayed with previous display data supplied from the means for supplying data to be displayed, and for emphasizing and converting the new display data to designated display data in response to a result of the comparison and the supplied data;

an illumination unit including a plurality of illumination areas for illuminating the liquid crystal display part; and

illumination control means for controlling an illumination start time and an illumination "on" time of each of the illumination areas of the illumination unit in response to a transition of transmittance of the liquid crystal layer.